

**IN THE CLAIMS**

1. -27 (canceled)

28. (new) An extracorporeal filter, comprising:

a housing having an interior volume separated by filter media into a filtrate part and blood part;

the housing including an outlet cap that defines a generally flat headspace of not more than 3 mm between the media and the outlet cap in fluid communication with the blood part;

the outlet cap having two openings;

the housing having a blood port connected to the first opening and a secondary port connected to the second opening such that the blood port and the secondary port are not connected except through the headspace;

the housing having an outlet in flow communication with the filtrate part;

the housing having a blood inlet port in communication with the blood part.

29. (new) The filter of claim 28, wherein the headspace lies between the ends of multiple tubular filter fibers and the outlet end cap.

30. (new) The filter of claim 28, wherein the first and second openings are separated by a portion of the end cap.

31. (new) The filter of claim 28, wherein the first opening is larger than the second opening.

32. (new) The filter of claim 28, wherein: the housing has a longitudinal axis, the first opening is aligned with the longitudinal axis and the second opening is remote from the longitudinal axis.

33. (new) The filter of claim 28, wherein: the housing has a longitudinal axis, the first opening is aligned with the longitudinal axis and the second opening is remote from the longitudinal axis and smaller than the first opening.

34. (new) The filter of claim 28, wherein the outlet cap has a cylindrical portion containing filter fibers, the outlet cap being removably connected to the cylindrical portion.

35. (new) The filter of claim 28, wherein the configurations of the first and second openings the blood and secondary ports are such that the only fluid channel connecting the blood and secondary ports includes the headspace as part of the fluid channel.

36. (new) The filter of claim 28, wherein the configurations of the first and second openings the blood and secondary ports are such that blood can leave the headspace through the first opening while fluid is simultaneously injected into the headspace through the second opening.

37. (new) The filter of claim 28, wherein the configurations of the first and second openings the blood and secondary ports are such that blood can leave the headspace through the first opening while fluid is simultaneously injected into the headspace through the second opening, and the fluid is thoroughly mixed with the blood before the blood leaves the headspace.

38. (new) The filter of claim 28, wherein the outlet cap has a wall defining a portion of the headspace and the openings are in the wall facing the headspace.

39. (new) An extracorporeal filter, comprising:  
a housing having a blood volume and a treatment fluid volume separated by a filter membrane;  
the housing defining blood inlet and outlet headspaces of the blood side;  
the filter membrane consisting substantially of filter fibers that exit commonly into at least one of the inlet and outlet headspaces, at least the outlet headspace being generally flat and no more than 3 mm in depth;  
the inlet and outlet headspaces being partly defined by interior walls of the inlet and outlet caps, respectively, each having a respective blood inlet and blood outlet;  
the outlet cap interior wall having first and second openings facing toward the outlet headspace, the first being connected to a blood outlet port and the second being connected to a secondary outlet port, such that blood is able to leave the outlet headspace while fluid is simultaneously injected into the outlet headspace.

40. (new) The filter of claim 39, wherein the outlet headspace lies between the ends of multiple tubular filter fibers and the outlet end cap.

41. (new) The filter of claim 39, wherein the first and second openings are separated by a portion of the end cap.

42. (new) The filter of claim 39, wherein the first opening is larger than the second opening.

43. (new) The filter of claim 39, wherein: the housing has a longitudinal axis, the first opening is aligned with the longitudinal axis and the second opening is remote from the longitudinal axis.

44. (new) The filter of claim 39, wherein: the housing has a longitudinal axis, the first opening is aligned with the longitudinal axis and the second opening is remote from the longitudinal axis and smaller than the first opening.

45. (new) The filter of claim 39, wherein the outlet cap has a cylindrical portion containing filter fibers, the outlet cap being removably connected to the cylindrical portion.

46. (new) The filter of claim 39, wherein the configurations of the first and second openings the blood and secondary ports are such that the only fluid channel connecting the blood and secondary ports includes the headspace as part of the fluid channel.